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A new species and the first males of *Suffasia* with a redilimation of the subfamilies of the Zodariidae (Araneae)

by

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With 11 figures

ABSTRACT

A new species of *Suffasia* Jocqué, so far only known from females, is decribed on males and females from Nepal. *S. tumegaster* n. sp. combines autopomorphies of the subfamilies Zodariinae and Storeninae which implies that the subfamilies are to be merged in one assemblage. This had been predicted by an earlier cladistic analysis. The position of the new species and the generic relationships in the large subfamily Zodariinae are discussed.

INTRODUCTION

The genus *Suffasia* was erected by JOCQUÉ (1991) for two species originally described in *Suffucia* Simon, which is now considered a synonym of *Asceua*. Both the species were only known from females. At the time of Jocqué's revision, this was unfortunate considering the critical position *Suffasia* takes in the taxonomy of the Zodariidae. Jocqué considered the Zodariinae and Storeninae as two different monophyletic subfamilies based on the following autapomorphies: the presence of a femoral organ in the Zodariinae and the presence of chisel-shaped metatarsal tuft hairs in the Storeninae. However, according to the cladogram presented in JOCQUÉ (1991), the Storeninae are a paraphyletic grouping. The cladogram indicates that these subfamilies should have been considered as belonging to one monophyletic group. The author was aware of this but argued that the autapomorphies warranted the separation of these two subfamilies. The characters of *Suffasia*, which is the sister-group of all other Zodariinae, are evidently crucial in this argument but the scarcity of the material and the absence of males hampered the interpretation of *Suffasia*'s position.

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A collection of spiders from Nepal made by Y. Löbl, contains a new species of *Suffasia* represented by an important number of specimens, males as well as females. It appears that it has important consequences for the taxonomy of the Zodariidae.

The format and description follows that of JOCQUÉ (1991). All measurements are in mm.

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***Suffasia tumegaster* new species** (figures 1–10)

M a t e r i a l : Holotype male: NEPAL, Kathmandu, Phulcoki, 2500 m, 10.V.1981, litter in oak forest near crest, Y. Löbl & A. Smetana (MHNG).

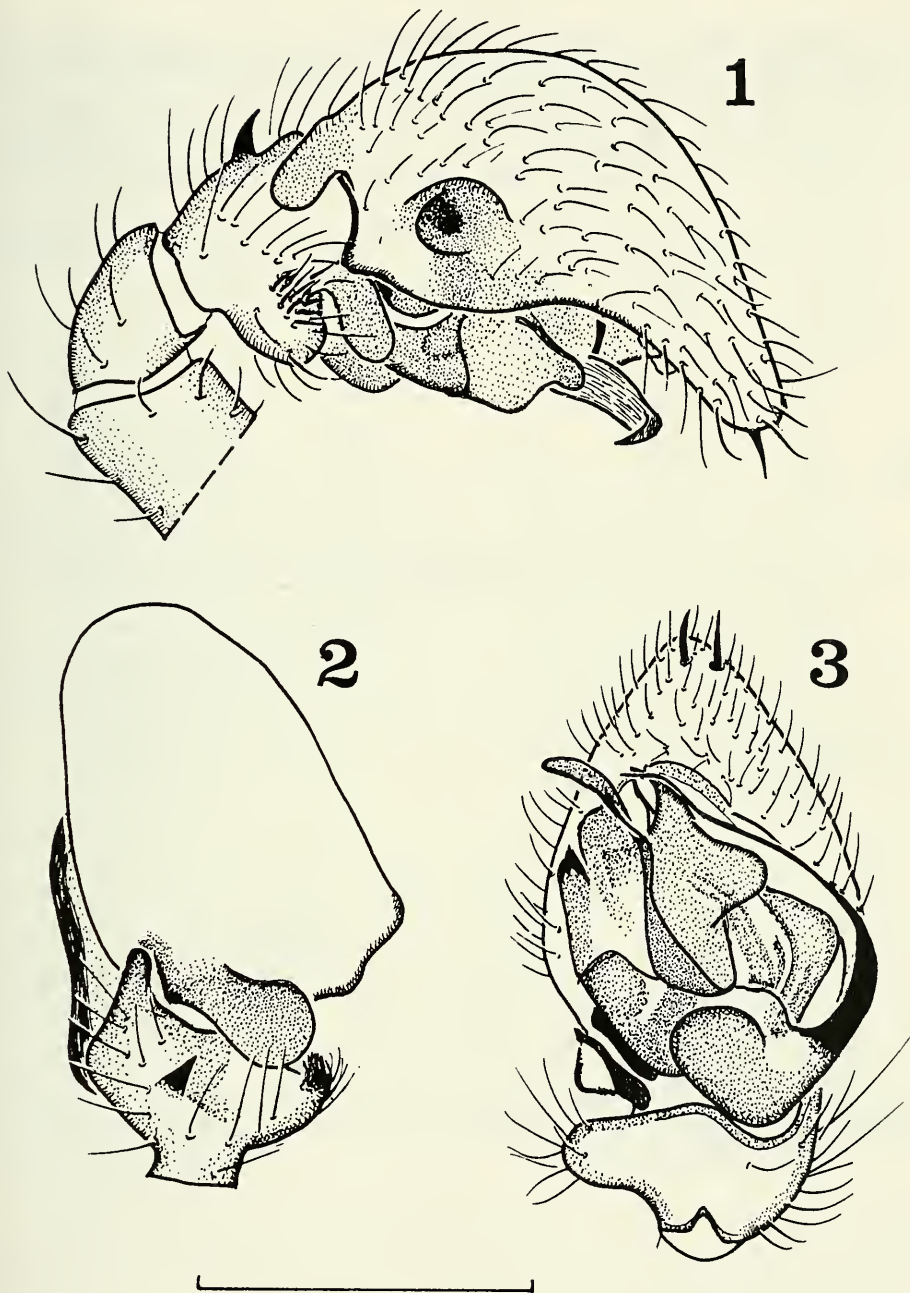
Paratypes: NEPAL (all material collected by Y. Löbl & A. Smetana): 1 ♀: together with holotype; 3 ♂ 2 ♀ 4 juv.: Kathmandu, Phulcoki, 2500 m, 10.V.1981, litter in oak forest near crest (KBIN); 1 ♂: northern slope, further as previous; 3 ♂ 3 ♀ 2 juv.: Malemchi, 2800 m, 14.IV.1981, litter at base of wall (MHNG); 6 ♂ 6 ♀ 4 juv.: Chaubas, 2500 m, 4-5.IV.1981, litter in rhododendron forest (MHNG); 4 ♂ 5 ♀ 11 juv.: Gul Bhanjyang, 2600 m, 6.IV.1981, litter in oak forest (MHNG); 1 ♀, 1 juv.: Barabhise, Dobate Ridge, 3000 m, 7.V.1981, pine litter (MHNG); 2 ♂ 3 juv.: Phulcoki, 2600-2700 m, 15.X.1983, dry forest, litter (MHNG); 3 ♀: Phulcoki, 2550-2650 m, 14-17.X.1983, dry forest, litter (MHNG; 1 ♀ in KBIN); 5 ♂ 1 ♀ 5 juv.: Phulcoki, 2500 m, northern slope, 28-29.IV.1984, litter at rock base (MHNG); 1 ♀: Phulcoki, 2600 m, northern slope, 16.X.1983, litter at rock base (MHNG); 1 ♂ 1 ♀ 1 juv.: Induwa Kola valley, 2100 m, 17.IV.1984, forest edge, litter (KBIN); 1 ♂ 2 ♀: 2000 m, mosses and litter in swampy area, further as previous; 1 ♂ 1 ♀ 3 juv.: Mangmaya, northern slope of hill to NW, 2300 m, 6.IV.1984, dry forest, litter, (MHNG); 1 ♀: Num, Arun valley, near main bridge, 1050 m, 20.IV.1984, secondary dry forest (MHNG); 8 ♂ 3 ♀ 4 juv.: Mangsingma, forest to S, 2200 m, 11.IV.1984, litter in ravine (MHNG); 1 ♂ 1 juv.: Mangsingma, crest to S, 2800 m, 7.IV.1984, rhododendron-bambou litter (MHNG); 2 ♂ 1 ♀ 4 juv.: Godawari, forest above botanical garden, 1600 m, 31.III.1984, litter, (MHNG); 4 ♂ 2 ♀ 2 juv.: Kuwapani, forest to NW, 2350 m, 5.IV.1984, humid litter (MHNG); 1 ♀: Kuwapani, forest to NW, 2250 m, 24.IV.1984, litter on fallen trunk (MHNG).

D i a g n o s i s : the male is easily recognized by the dorsal cymbial flange overlying the palpal tibia, the cymbial lateral pit and the swollen venter of the abdomen. The female is characterized by the epigyne with frontal entrance openings and the course of the copulatory ducts. The small AME are an additional diagnostic character for both sexes.

E t y m o l o g y : *Tumegaster* is a contraction of the Latin words *tumidus* (swollen) and *gaster* (abdomen); this noun in apposition obviously refers to the swollen ventral side of the male abdomen.

D e s c r i p t i o n : Male holotype (range of paratypes in brackets): total length 3.15 (2.79-3.35); carapace 1.43 (1.30-1.58) long, 1.05 (1.02-1.21) wide.

Colour: carapace orange brown with network of dark lines dominated by large U-shaped pattern in front of fovea and darker area on lower half of clypeus; chelicerae pale brown; sternum yellowish brown with faint darker pattern; legs yellow; abdomen: dorsum dark sepia with narrow brown scutum in anterior half, followed by two pairs of pale spots and three pale bars; posterior one in front of the spinnerets on either side with triangular extension; venter pale except for swollen area which is pale brown and followed by two dark patches touching spinneret area; epandrium pale yellow.



FIGS 1-3.

Suffasia tumegaster n. sp., male palp: 1. lateral view; 2. dorsal view; 3. ventral view.
(scale line = 0.5 mm).

Carapace smooth. Chilum single, triangular, higher than wide; difficult to see because underlain by dark, wide, membranous triangle. Anterior margin of chelicerae with two teeth of which the distal one is the largest.

Eyes: AME: 0.07; ALE: 0.08; PME: 0.08; PLE: 0.09; AME-AME: 0.02; AME-ALE: 0.05; PLE-PLE: 0.07; PME-PLE: 0.11.

MOQ: AW = 0.69 PW; AW = 0.55 L. Clypeus 0.31; high or 3.9 times the diameter of an ALE.

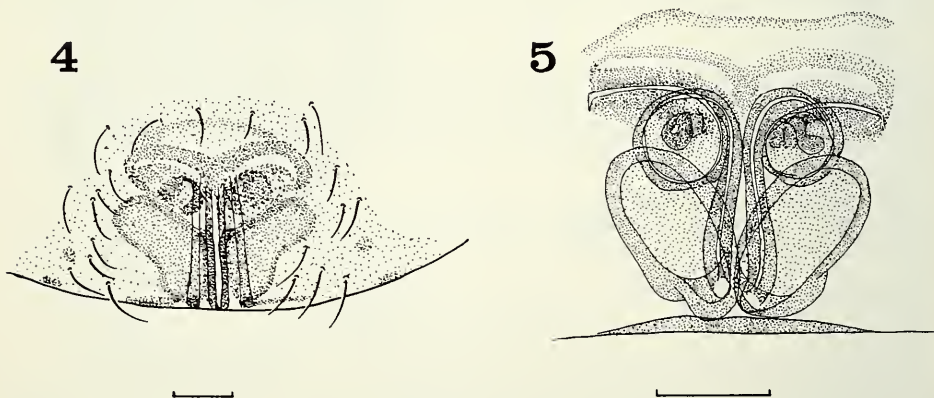
Legs: Spination poorly developed: all femora with two dorsal spines. Tibiae and metatarsi with flattened incised hairs. Metatarsi II, III and IV with distoventral tuft of chisel-shaped hairs (fig. 6). Femoral organ on all legs, with two smooth hairs (fig. 7).

Measurements

	F	P	T	Mt	t	Tot
I	1.15	0.40	1.01	1.05	0.55	4.16
II	1.07	0.40	0.81	0.91	0.48	3.67
III	1.01	0.42	0.75	1.01	0.42	3.61
IV	1.25	0.42	1.13	1.51	0.61	4.92

Abdomen ventrally with a wide, slightly sclerotized, transverse swelling halfway between the epigastric fold and the spinnerets (fig. 8). Epiandrium poorly sclerotized. Dorsal frontal scutum very narrow, poorly sclerotized.

Male palp (fig. 1-3, 9, 10): tibia with short dorsal spiniform apophysis and lateral haired boss. Cymbium with proximal dorsal flange overlying anterior dorsal margin of tibia (fig. 2, 9) and deep proximal lateral hole (fig. 1, 10). Embolus relatively long, strongly tapering towards extremity; base of embolus separated from rest of tegulum; tegular apophysis well developed, twisted, pointing outward; conductor a distal transverse ridge of tegulum.



FIGS 4-5.

Suffasia tumegaster n. sp., epigyne: 4. ventral view; 5. dorsal view, cleared. (scale line = 0.1 mm).

Female paratype from type locality (range of paratypes in brackets): total length 3.96 (3.11-4.51); carapace 1.71 (1.39-2.18) long, 1.30 (0.98-1.58) wide.

Colour as in male, but dark marking in front of fovea more V-shaped. Abdomen generally as in male but scutum absent; chevrons instead of transverse pale bars; posterior pale triangles separated. Eyes, chilum and chelicerae as in male.

Legs: spination, femoral organs and ornamentation as in males.

Measurements

	F	P	T	Mt	t	Tot
I	1.02	0.45	1.02	1.08	0.61	4.18
II	0.98	0.45	0.80	0.96	0.57	3.76
III	1.29	0.45	0.80	1.08	0.51	4.13
IV	1.31	0.51	1.08	1.57	0.63	5.10

Female palp with long conical tarsus (fig. 11).

Epigyne (fig. 4-5): entrance openings on antero-lateral side of epigyne; thin-walled copulatory ducts run inward describing loop in anterior part, thence they run backward along central longitudinal axis and enter large, oval spermathecae near posterior margin.

Other material examined: none.

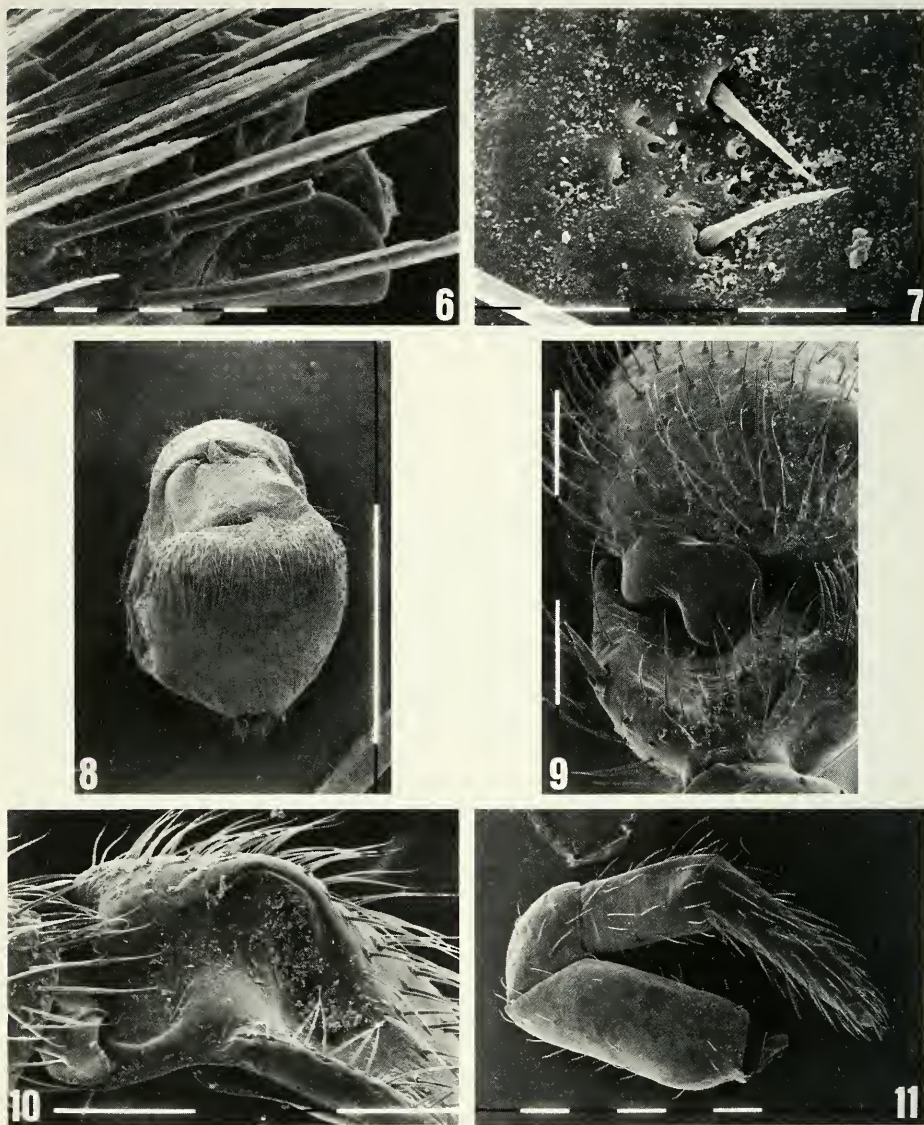
Distribution: central and eastern Nepal, 1050 to 3000 m.

DISCUSSION

The attribution to *Suffasia* of the species here described, is not entirely sure. So far the genus was only known from a few females from South India (Kodaikanal in the Palni Mts.) and since many zodariid genera are mainly diagnosed on characters of the male palp an unambiguous definition of *Suffasia* has to wait the description of the male of its type species. Diagnostic characters of *Suffasia* are the female palp with a long conical tarsus, the dark network pattern on the carapace (not mentioned in JOCQUÉ, 1991) and the presence of a femoral organ and flattened incised hairs on the legs in combination with a chilum and cheliceral teeth, which is unique in the Zodariinae. *S. tumegaster* shares all these characters with the type species of the genus, *Suffasia tigrina*. However, that species lacks metatarsal hair tufts and chisel-shaped hairs, the autapomorphy of the Storeninae. On the other hand it has a well developed leg spination and a peculiar epigyne with frontal thick-walled spermathecae, and sclerotized copulatory ducts running forward. *S. tumegaster* is different in all these respects: it has chisel-shaped hairs in metatarsal tufts, poorly developed leg spination and a differently organized epigyne in which the spermathecae are near the posterior margin and the thin-walled copulatory ducts run backward.

It might therefore well be that the present species should be placed in a new genus but as long as the males of the type species are not known this cannot be decided. In any case, the species is strongly related to *Suffasia* although it has some remarkable characters in the male palp which remind of *Forsterella* Jocqué from New Zealand (isolated base of the embolus) and of *Asceua* Thorell and *Mallinella* Strand (well developed conductor), two Palaeotropical genera.

The most remarkable statement is that of the combination of chisel-shaped hairs in the metatarsal tufts, cheliceral teeth and a chilum, all characters of the Storeninae, with the



FIGS 6-11.

Suffasia tumegaster n. sp. 6. metatarsal tuft, chisel-shaped hairs; 7. femoral organ on femur II; 8. male abdomen ventral view; 9. male palp, proximal part of cymbium, dorsal view; 10. cymbium, lateral view; 11. female palp, lateral view (scale line = 0.01 mm for 6 and 7, 1 mm for 8, 0.1 mm for 9, 10 and 11).

presence of a femoral organ and flattened incised hairs on the legs, autapomorphies of the Zodariinae. From this combination it is clear that the autapomorphies used by JOCQUÉ (1991) to separate the mentioned subfamilies do not hold. The cladistic analysis in that paper indeed suggested that the Zodariinae and Storeninae are one large monophyletic group. This implies that the Storeninae have to be deleted and that the Zodariidae only contain 5 subfamilies. 32 out of 47 genera now belong in the Zodariinae.

This monophyletic assemblage is largely composed of genera which are endemic to particular continents. It is very surprising that the genera which are found in Africa are apparently more closely related to the Australian Zodariinae than to the genera found in South America. The five Neotropical genera are indeed near the root of the zodariine branch whereas the Australian ones are situated in between the Neotropical and the other Palaeotropical-Palaeartic ones. This statement is at least puzzling: it is in contrast with the timing of major plate tectonic events that caused the breakdown of Gondwanaland, as deduced from geological data. If more global revisions of old invertebrate groups become available, the picture of the Gondwanaland breakdown chronology might perhaps change altogether.

REFERENCE

- JOCQUÉ, R. 1991. A generic revision of the spider family Zodariidae (Araneae). *Bull. Am. Mus. Nat. Hist.* 201: 1-165, 398 figs.